

WHAT IS CLAIMED IS:

- 1 1. A method for locating signal path-rays in a
2 communications system, comprising the steps of:
3 receiving a signal;
4 decimating said signal to produce a decimated
5 signal;
6 processing said decimated signal to produce at
7 least one first location; and
8 processing said signal and a generated code using
9 said at least one first location to produce at least one
10 second location.

1 2. The method according to Claim 1, wherein:
2 said step of processing said decimated signal to
3 produce at least one first location comprises the step of
4 processing said decimated signal to produce said at least one
5 first location having a first precision;
6 said step of processing said signal and a generated
7 code using said at least one first location to produce at
8 least one second location comprises the step of processing
9 said signal and said generated code using said at least one
10 first location having said first precision to produce said
11 at least one second location having a second precision; and
12 said first precision being less precise than said
13 second precision.

1 3. The method according to Claim 1, further comprising
2 the step of:
3 sampling said signal in an analog-to-digital
4 conversion a plurality of times per chip prior to said step
5 of decimating; and
6 wherein said signal in said step of decimating
7 comprises the sampled signal.

1 4. The method according to Claim 1, wherein said
2 communications system comprises a wireless Code Division
3 Multiple Access (CDMA) communications system.

1 5. The method according to Claim 1, wherein said step
2 of processing said decimated signal to produce at least one
3 first location comprises the step of applying said decimated
4 signal to at least one filter to produce said at least one
5 first location.

1 6. The method according to Claim 5, wherein said step
2 of applying said decimated signal to at least one filter to
3 produce said at least one first location comprises the step
4 of applying said decimated signal to at least one finite
5 impulse response (FIR) filter of at least one matched filter.

1 7. The method according to Claim 5, wherein said step
2 of processing said decimated signal to produce at least one
3 first location further comprises the step of applying an
4 output of said at least one filter to a peak detector to
5 determine said at least one first location.

1 8. The method according to Claim 1, wherein said step
2 of processing said signal and a generated code using said at
3 least one first location to produce at least one second
4 location comprises the step of shifting one of said signal
5 and said generated code responsive to said at least one first
6 location to create a shifted variable and a non-shifted
7 variable.

1 9. The method according to Claim 8, wherein said step
2 of processing said signal and a generated code using said at
3 least one first location to produce at least one second
4 location further comprises the step of correlating said
5 shifted variable with said non-shifted variable to produce
6 a plurality of correlation values.

1 10. The method according to Claim 9, wherein said step
2 of processing said signal and a generated code using said at
3 least one first location to produce at least one second
4 location further comprises the step of comparing said
5 plurality of correlation values to select said at least one
6 second location.

1 11. The method according to Claim 9, wherein said
2 shifted variable comprises said signal and said non-shifted
3 variable comprises said generated code.

1 12. The method according to Claim 9, wherein said
2 shifted variable comprises said generated code and said non-
3 shifted variable comprises said signal.

1 13. The method according to Claim 1, further comprising
2 the step of forwarding said at least one second location to
3 rake fingers to enable subsequent maximal ratio combining
4 (MRC) of said signal.

1 14. A receiver system for locating signal path-rays in
2 a communications system, comprising:
3 a decimation part that decimates a signal in
4 accordance with a decimation factor;
5 at least one filter connected to said decimation
6 part, said at least one filter involved in determining a
7 first location of said signal;
8 a code generator part, said code generator part
9 adapted to generate at least one code pattern;
10 at least one shifter connected to said at least one
11 filter to receive said first location; and
12 at least one correlator, said at least one
13 correlator correlating a version of said signal to a version
14 of said at least one code pattern.

1 15. The receiver system according to Claim 14, wherein
2 said shifter shifts said signal, said version of said signal
3 is a shifted version of said signal, and said version of said
4 at least one code pattern is an un-shifted version of said
5 at least one code pattern.

1 16. The receiver system according to Claim 14, wherein
2 said shifter shifts said at least one code pattern, said
3 version of said signal is an un-shifted version of said
4 signal, and said version of said at least one code pattern
5 is a shifted version of said at least one code pattern.

1 17. The receiver system according to Claim 14, further
2 comprising an analog-to-digital converter, said analog-to-
3 digital converter converting said signal to a digital,
4 sampled signal prior to said decimation part decimating said
5 signal.

1 18. The receiver system according to Claim 17, wherein
2 a sampling rate of said analog-to-digital converter is such
3 that an analog version of said signal is sampled a plurality
4 of times per chip.

1 19. The receiver system according to Claim 18, wherein
2 said sampling rate and said decimation factor are
3 determinative, at least in part, of a precision of said first
4 location.

1 20. The receiver system according to Claim 14, further
2 comprising a peak detector; and

3 wherein said at least one filter comprises a
4 plurality of matched filters, said plurality of matched
5 filters include at least one finite impulse response (FIR)
6 filter, an input of said peak detector is comprised of an
7 output of said at least one FIR filter, and said first
8 location is comprised of an output of said peak detector.

1 21. The receiver system according to Claim 14, wherein
2 said at least one correlator comprises a plurality of
3 correlators, each of said plurality of correlators including
4 a multiplying mixer and an integrator.

1 22. The receiver system according to Claim 14, further
2 comprising a comparison part; and

3 wherein said at least one correlator comprises a
4 plurality of correlators, each of said plurality of
5 correlators outputs a correlation value, said comparison part
6 selects a highest value from among the output correlation
7 values, and a second location output from said comparison
8 part is comprised of said highest value or a related value.

1 23. The receiver system according to Claim 22, wherein
2 a first precision of said first location is less exact than
3 a second precision of said second location.

1 24. The receiver system according to Claim 14, wherein
2 said communications system comprises a wireless Code Division
3 Multiple Access (CDMA) communications system.

1 25. The receiver system according to Claim 14, further
2 comprising a comparison part and a plurality of rake fingers,
3 said comparison part receiving at least one output from said
4 at least one correlator and providing a second location to
5 at least one of said plurality of rake fingers.

1 26. A method for searching for signal path-rays in a
2 Code Division Multiple Access (CDMA) communications system,
3 comprising the steps of:
4 receiving a signal;
5 determining a coarse location of said signal;
6 determining a fine location of said signal based,
7 at least in part, on said coarse location; and
8 providing said fine location to rake fingers.

1 27. The method according to Claim 26, wherein said step
2 of determining a coarse location of said signal comprises the
3 step of decimating said signal, said signal having been
4 oversampled.

1 28. The method according to Claim 26, wherein said step
2 of determining a fine location of said signal based, at least
3 in part, on said coarse location comprises the steps of:
4 generating a code pattern;
5 shifting responsive to said coarse location;
6 correlating said code pattern to said signal, at
7 least one of said code pattern and said signal having been
8 shifted in said step of shifting; and
9 selecting said fine location in response to said
10 step of correlating.

- 1 29. A method for locating at least one signal path-ray
2 in a spread spectrum system, comprising the steps of:
3 receiving a spread spectrum signal; and
4 determining a location of said spread spectrum
5 signal using, at least partly, a decimated version of said
6 spread spectrum signal.